

# Mobile Monday (MoMo) Pakistan

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## MoMo Pakistan discussed “3G / 4G wireless Network” implementation issues in Pakistan.

Mobile Monday (MoMo) event was held on Monday 21<sup>st</sup> March, 2011 in the faculty cafeteria, Faculty Block, CIIT, Park Road, Islamabad. As PTA was seeking expert’s opinion on implementation of 3G/4G in Pakistan so the theme of this event was declared as “3G/4G wireless Network implementation in Pakistan: Is this required”. Different Mobile Operators including Ufone, Zong, Warid, Falcon Engineering etc. participated in the event. Apart from Industry there was huge participation from academia other than CIIT. The Faculty and students which participated were FAST-NU, international Islamic University, Urdu University and Air University. Different projects were on display and the participants took interest in these projects.



*Continued on page 2*

### INSIDE THIS ISSUE

1	MoMo event - 3G/ 4G implementation
1	Evolution of Mobile Communication
2	Continuing Article from Page 1
3	Evolution of Mobile Comm. ---- Continuing Article
4	Other Events

## Evolution of Mobile Communication- A Study:

(By Mr. Shahwaiz Iqbal & Dr. Mahmood Ashraf)

The world of telecommunications has entered in a new era with the introduction of third generation (3G) and 4 G mobile networks in several countries around the world. 3G and 4G offers a bundle of new services, and the network is more like of “service network” rather than a classical plain cellular network. Before going into the features of 3G and 4G mobile networks, let’s understand different generations which describe different technologies that can be used from the mobile phones. The ‘G’ stands for generation. These generations started off with the introduction of 1G phone.

### First Generation

The First Generation phones were also called as ‘brick phones’. They were indeed the first mobile phones to have been introduced in the late 1970s in the market. They were based on Semiconductor technology and microprocessors made smaller, lighter, and more sophisticated mobile systems a reality. The prominent ones among 1G systems were Advanced Mobile Phone System (**AMPS**), Nordic Mobile Telephone (**NMT**), and Total Access Communication System (**TACS**).

### Feature of 1G

- Analogue system
- Mobility – can take the cellular where needed
- Circuit switched technology
- Basic voice calls only
- Limited local & regional coverage
- Phones were large in size
- Low capacity

### Second Generation (2G)

Second-Generation (2G) mobile systems were introduced in the end of 1980s. Low bit rate data services were supported as well as the traditional speech service. Compared to first-generation systems, second-generation (2G) systems use digital multiple

*Continued on page 3*

The program started with short introduction about the theme of the event. Later, a presentation was delivered by Mr. Shahwaiz Iqbal on the generation of Mobile networks. The presentation was focused on the difference between 1G, 2G, 2.5G, 3G and 4G and what further hardware/software etc. will be required to implement 3G/4G in Pakistan.



After Presentation, an open discussion was started among the participants. Everyone took part in the discussions and presented their point of view. The participants gave their opinions on whether to adopt new technology and be a part of the technology race or to restrain from adopting new technology (3G/4G).



Some participants were against the adaptation of new technology and they said that this is not needed in Pakistan. The opinion was that the people of Pakistan generally use mobile phone for plain voice call and for text messages. Therefore going for 3G and beyond will be an additional burden on mobile operators. Going to 3G and beyond means that the operators have to get new license from PTA and upgrade the hardware and software.

Another group of participants were in the favour of adopting new technology and they were of the opinion that if PTA goes for licensing of 3G, the operators will automatically invest in new technology and will also upgrade their systems. This up-gradation and adaptation of new technology will also create new

business opportunities in the mobile industry. It was also emphasized that few years ago there were many people who did not have their mobile phone but now more than 90% people use mobile phone. Similarly, two years from now 3G /4G phones will be a very common and less expensive technology which will be adopted by everyone. Col.(R) Shahid Ansari and Dr. Mahmood Ashraf emphasized on the use of MoMo web site as a platform of information and ideas sharing.

At the end of the event following recommendation were finalized to be forwarded to PTA:

- 3G/4G licensing shall be carried out so that Govt. of Pakistan shall get some financial benefits through auction of these frequency bands.
- Licenses have been defined to be technology neutral.
- There is need to determine whether 3G will be the concern of new entrants as well as existing operators or existing operators only.
- The scope of service for 3G is very extensive as compared with 2G since 3G is providing broadband multimedia services. Therefore, the best method of regulating these services will have to be found.
- Implementation of 3G/4G will provide new business opportunities for software developer and mobile industry. Also, it may provide new job openings for the community.
- The equipment required to implement a 3G/4G networks is still very expensive. Carriers and providers have to plan carefully to make sure that expenses are kept realistic.
- Educating the users about effective access to 3G technologies.
- Time scale for 3G introduction: To determine when 3G will have to be rolled out. The demand for 3G will be felt when the users will have a need for multimedia communication services coupled with mobility. The prices of 3G handsets have not made them popular yet.
- The public must realize that though high-speed internet may be achieved, however, it will not be as good as wired Internet – at least not at first. Correct perception is required, when 3G and later 4G services are deployed, there may be a great deal of disappointment after implementation of technology, and perceptions could become negative. If this were to happen, neither 3G nor 4G may realize its full potential. ❖

access technology, such as TDMA (Time Division Multiple Access) and CDMA (Code Division Multiple Access).

The development of 2G cellular systems was initiated to improve transmission quality, system capacity, and coverage. Consequently, compared with first-generation systems, higher spectrum efficiency, better data services, and more advanced roaming were offered by 2G systems. In Europe, the Global System for Mobile Communications (GSM) was deployed to provide a single unified standard. GSM provides voice and limited data services, and uses digital modulation for improved audio quality. 2G cellular systems include GSM, digital AMPS (D-AMPS), Code-Division Multiple Access (CDMA), and Personal Digital Communication (PDC).

### Feature of 2G

- Digital system with data services
- Digital encryption of the voice call.
- Circuit switched technology
- Good subjective speech quality
- Low terminal and service cost
- Support for international roaming.
- Support for range of new services and facilities



### 2.5 Generation

2.5G is the enhanced version of 2G technology. The enhancement achieved through implementing a packet switched domain in addition to circuit switched domain. This is to give user a better services & access to the internet. 2.5G gives higher data rates & additional capabilities. The technology used to access internet is General Packet Radio Service (GPRS). GPRS can provide data rates from 56 kb/s, up to 115 kb/s. access.

### 2.75 Generation

Another enhancement in 2G technology is the 2.75G & it is another move towards 3G technology. EDGE, Enhanced GPRS (EGPRS), or IMT Single Carrier (IMT-SC) is a backward compatible digital mobile phone technology & it allows improved data transfer rates. EDGE is developed in 2003 by AT&T in US. EDGE is standardized by 3GPP & it provides increased capacity

of GSM/GPRS networks. Higher data rates are achieved by this generation of networks.

### The Third Generation

The International Telecommunication Union (ITU) defined the demands for 3G mobile networks with the IMT-2000 standard. An organization called 3rd Generation Partnership Project (3GPP) has continued that work by defining a mobile system with IMT-2000 standard. In Europe it was called UMTS (Universal Terrestrial Mobile System). CDMA2000 is the name of the American 3G variant



With the frequent use of the Internet and increasing popularity of Multimedia services, there was arising need to deliver these services to mobile users. This requirement revealed the limitations of basic GSM in that respect, the data rate being too low. This was the main reason why 3G came into existence.

The first commercial 3G network was launched by NTT DoCoMo in Japan based on W-CDMA technology in Oct 2001. The second network to go commercially live was by SK Telecom in S. Korea on the 1xEV-DO (Evolution-Data Optimized) in Jan 2002 followed by another S. Korean 3G network was by KTF.

In Europe, the commercial 3G services were introduced in March 2003 by 3 in the UK and Italy. This was based on the W-CDMA. The first commercial USA 3G network was by Monet Mobile Networks, on CDMA2000 1xEV-DO and the second 3G network operator in the USA was Verizon Wireless in Oct. 2003 also on CDMA2000 1xEVDO. The first commercial launch of 3G in Africa was by EMTel in Mauritius on W-CDMA standard and in Morocco, was provided by the new company "WANA" in late March 2006.

### Problems in Roll out of 3G

Roll-out of 3G was delayed in some countries due to enormous costs of additional spectrum licensing fees. In many countries, 3G networks do not use the same radio frequencies as 2G, so mobile operators must build entirely new networks and license entirely new frequencies; an exception is the United States where carriers operate 3G service in the same frequencies

as other services. The license fees in some European countries were particularly high. Other delays were due to the expenses of upgrading equipment for the new systems. Still several major countries such as Indonesia and Pakistan have not awarded 3G licenses and customers await 3G services. China delayed its decisions on 3G for many years. In January 2009, China launched 3G but interestingly three major companies in China got license to operate the 3G network on different standards.

### Features of 3G

- Wide-area wireless voice telephony.
- Broadband wireless data and video calls
- Speeds of up to 2 Mbps are achievable
- Additional features also include HSPA (High Speed Packet Access) data transmission capabilities able to deliver speeds up to 14.4 Mbps on the downlink and 5.8 Mbps on the uplink.

### Forth Generation

Also called "All IP network". It is expected that this generation of networks will give a comprehensive and secure all-IP based solution, which will have facilities like IP telephony, ultra-broadband Internet access, gaming services and streamed multimedia facility to the user.

### Features of 4G

- Allows transfer of larger data packets with less bit errors
- Multitasking capability
- Improved data throughput rate



- Allows faster and more stable access to multimedia and video content on the go
- Users freedom and flexibility to select any desired service with reasonable QoS and affordable price, anytime, anywhere.

4G mobile communication services started in 2010 but will become mass market in about 2014-15.

### Technologies aiming for 4G

Third Generation Partnership Project (3GPP) is working on LTE-Advanced to meet the IMT-Advanced requirements for 4G. WiMAX Forum and IEEE are also evolving WiMAX through IEEE 802.16m

or WiMAX-m to satisfy 4G requirements. ❖

## MoMo Pakistan Web Site:

Please feel free to add your comments and ideas on the mobilemonday website.

[www.mobilemonday.net.pk](http://www.mobilemonday.net.pk)

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**The Tentative date for next Mobile Monday event is Monday 18<sup>th</sup> April, 2011.**

## Other Events:

**BMIP** (August 14, 2011)

*The Best Mobile Innovation Pakistan Award is an annual competition to promote innovations, new entrepreneurship as well as increase implementation of wireless related technology in Pakistan and in the world! For details about BMIP please visit:*

[www.bmip.org](http://www.bmip.org)

**CEPEX 2011** (April 13 to 14, 2011)

*The Department of Electrical Engineering, CIIT Islamabad holds this yearly event with the objective to blend together all the key elements of the two engineering spheres academia and industry. The core events of CEPEX are project exhibition, Symposium, Industrial Expo etc. ■*

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